

Mark Scheme

May 2023

Pearson BTEC Level 3 - IT

Unit 1: Information Technology Systems 31760H

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

BTEC Next Generation Mark Scheme Template

IT Unit 1 June 2023

Question Number	Answer	Mark
1ai	Any two from:	2
	Web authoring software (1)	
	Desktop publishing software (1)	
	Presentation software (1)	
	Graphics software (1)	
	Multimedia (1)	
	Accept brand names	
	Accept any other relevant software/phrasing/wording.	

Question Number	Answer				
1aii	 Award up to two marks for each of two linked explanations, from: Enhanced appearance using page layouts (1) because you can arrange/rearrange and manipulate text and graphics with precision to fit into the available space (1) Document templates available online (1) which will improve the appearance and create a professional document customised to suit the target audience (1) Can import data from other packages (1) that can be embedded or linked and updated automatically (1) Available tools such as spell checker, grammar checker, thesaurus (1) to ensure the document is error free (1) Accept any other relevant phrasing/wording	4			

Question Number	Answer	Mark
1b	Award up to two marks for each of two linked explanations, from:	4
	Trojan Horse (1) contains malicious code that carries out actions when executed (1)	
	Worm (1) replicates itself and uses a computer network to spread to other computers (1)	
	Spyware (1) is used to gather information about organisations/people by detecting key presses (1)	
	Adware (1) is a form of spyware that collects information and uses it to display advertisements in a web browser (1)	
	Ransomware (1) restricts access to computer systems by encrypting files on the hard drive (1)	
	Malicious bots (1) can act as spyware and are designed to infect central servers/servers (1)	
	Rootkit (1) enables unauthorised users gaining control of a computer system without being noticed / remain hidden on your computer (1)	
	Accept any other relevant phrasing/wording	

Question Number	Answer			
1c	Award one mark for identification and one additional mark for appropriate expansion.	6		
	 Ease of use/Intuitiveness (1) Obvious places for users to enter data (1) Have logical flow through the questions to help users navigate (1) Appropriate controls, e.g. buttons/radio buttons/tick boxes/drop down menus (1) Sensible and clear field labels (1) Pop-up instructions to help users (1) Consistent layout/navigation/fonts/colours (1) 			
	 Accessibility (1) Provide text alternatives for non-text content (1) Make it available to assistive technologies (1) Allow screen readers (1) Use sufficient contrast to make things easy to see (1) Make text readable/understandable/concise/simple (1) 			

- Error reduction / accuracy of data (1)
 - Provide ways of reviewing responses (1)
 - Provide ways of undoing/editing (incorrect) responses (1)
 - Validation rules / Error reduction methods e.g. input masks, presence checks, etc. (1)
 - Error messages should give information on how to correct error/proceed (1)
- Functionality/ Performance (1)
 - Consider alternative ways of accessing/entering data e.g. onscreen keyboard/attached conventional keyboard (1)
 - Allow for saving on an on-going basis (1)
- Compatibility
 - Compatibility with a range of platforms e.g. tablet/smart phone/laptop/PC (1)
 - Compatibility with operating systems/browser e.g.
 Windows/iOS (1)
 - Consideration of file types/sizes for download (1)

Accept any other relevant phrasing/wording

Question Number	Indicative content
1d	Answers will be credited according to the learner's demonstration of knowledge and understanding of the material, using the indicative content and level descriptors below. The indicative content that follows is not prescriptive. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers.
	Learners discuss the ways the teachers can use IT to enhance teaching and learning.
	Online / eLearning
	Materials can be produced in different formats to suit the target audience and learning styles, such as text, videos, animations, etc.
	Pupils can access materials where and whenever they choose, which allows a flexible learning approach
	 Variety of activities can be included to stimulate and motivate learning, such as quizzes, games, tests etc.
	Can target specific area of learning to suit the audience, and pupils can revisit materials when required
	Videoconferencing
	 Pupils do not have to physically attend lessons if they are off school, the teachers can keep them updated, e.g., due to illness
	Cost implications of purchasing specialist computer hardware and software
	<u>Virtual Learning Environment (VLE)</u>
	Can create chat rooms or forums to aid learning, and sharing of expertise
	Can operate with small number of pupils and/or more than one class at the same time
	Saves travelling to school to access learning, because pupils can work from their own homes via distance learning
	Pupils can work at their own pace and access more course materials
	Interactive Whiteboards (IWB)
	Multifunctional device used to teach/demonstrate in the classroom environment
	Can engage the pupils using a variety of methods, e.g. sound, video, animation, etc.
	Encourages pupil interaction (quizzes)
	<u>Servers</u>
	Used to host e-learning websites and virtual learning environments

• Learners can access learning resources remotely

Personal computers

Allows access to e-learning and virtual learning environments for study purposes

• Can prepare learning resources

Mark scheme (award up to 6 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.

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Level	Mark	
Level 0	0	No rewardable material.
Level 1	1-2	 Demonstrates isolated elements of knowledge and understanding There will be major gaps or omissions Few of the points made will be relevant to the context in the question Limited discussion which contains generic points Little or no consideration of different aspects
Level 2	3-4	 Demonstrates some accurate knowledge and understanding There will be some gaps or omissions Some of the points made will be relevant to the context in the question, but the link will not always be clear Displays a partially developed discussion which considers some different aspects There will be some consideration of how they interrelate
Level 3	5-6	 Demonstrates mostly accurate and detailed knowledge and understanding There will be minor gaps or omissions Most of the points made will be relevant to the context in the question, and there will be clear links Displays a well-developed and logical discussion which clearly considers a range of different aspects Clearly shows how they interrelate

Question Number	Answer	Mark
2a	Award one mark for identification and one additional mark for appropriate expansion.	4
	Application software	
	A program / set of programs designed for a specific user purpose (1) such as word processing, databases, spreadsheets, etc. (1)	
	Used to carry out end-user tasks (1) without needing to know how the operating system will carry them out (1)	
	System software	
	The interface between the computer and user (1) responsible for interacting with hardware / supporting applications / to hide the complexity (1)	
	Contains the operating system and all utility programs (1) that manage computer resources (1)	
	Accept any other relevant phrasing/wording	

Question Number	Answer	Mark
2bi	Award one mark for identification and one additional mark for appropriate expansion.	4
	Access to source code (1) allows customisation to meet Luca's specific needs (1)	
	Luca will be able to work with other like-minded users to 'pinpoint' customisation (1) which is not likely with a large manufacturer (1)	
	Bugs in the code are often spotted and corrected more quickly than with proprietary software (1) as the users are not restricted by large organisation's procedures (1)	
	Can be more secure (1) as the people who are using the software have an inherent need to spot and correct errors quickly / hackers tend to target proprietary software (1)	
	Ongoing support will be free of charge (1) as it is provided by users/community, not the manufacturer (1)	
	More choice of operating system distributions (1) which focus on different user requirements (1)	
	Accept any other relevant phrasing/wording	

Question Number	Answer	Mark
2bii	Award one mark for identification and one additional mark for appropriate expansion.	2
	Must ensure OS is compatible with existing application software (1) or he will incur additional costs of replacing it / may have to spend time making the software work with the OS (1)	
	Some (specialised) application software may not run under open- source OS (1) which may make it difficult for Luca and his family to work from home / complete college assessments (1)	
	There may not be as many features included (1) which may make it difficult to carry out specific tasks / costs of additional features (1)	
	Support for the OS relies on the ongoing attention of the users/community (1) which may mean that the support may be sporadic / stop without warning (1)	
	Users may find open-source software harder (1) because they may be less familiar with it / requires greater technical competence (1)	
	Accept any other relevant phrasing/wording	

Question Number	Answer			
2c(i)	Award one mark for each point up to a maximum of four marks. • (Anti-virus software) monitors activity/scans computer/files (1) • Compares (activity) against a database of definitions (1) • Analyses the code/behaviour of the suspicious program (1) • Determines the nature of the threat (1) • Request actions from the user (1) • Give option to remove the threat (1) • Give option to quarantine the threat (1) • Log user actions to deal with similar future threats (1) Additional Guidance Do not accept 'removes the threat/virus' on its own	4		

Question Number	Indicative content
2c(ii)	Answers will be credited according to the learner's demonstration of knowledge and understanding of the material, using the indicative content and level descriptors below. The indicative content that follows is not prescriptive. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers.

Learners to discuss threats to data other than phishing.

Viruses and other malware

Malware:

- Most common types of malware include viruses, trojans, ransomware, bots or botnets, adware, spyware, rootkits, etc.
- Malware software is intentionally designed to cause harm to your computer.
- Malware software is programmed to reproduce, attack, and infect existing files on the system.
- Can target any type of file that the system can execute.

Viruses:

- Executable programs inserted into other programs.
- Remain dormant/hidden and will activate depending on the instructions in the code.
- Replicates itself to gain access to different parts of the computer code
- Transmitted from one computer to another through various means (installation of pirated programs / download of files from unsecure web pages / contaminated removable drives).
- Programmed to mutate and update in order to stay hidden from an antivirus.

Hackers

- Hackers use activities to compromise digital devices for
 - financial gain of stealing credit/debit card numbers or defrauding banking systems, stealing money, request new pins, make purchases, ruin credit, etc.
 - o a challenge
 - corporate espionage by stealing product and services information from a competitor to gain advantage
 - o a personal attack as revenge on a person/company
 - o to cause disruption to someone's computer/network systems.
- Hackers can:
 - o Hijack usernames and passwords
 - Sell information to other parties illegally
- Hackers are curious and enjoy trying out new techniques and ways to invade a computer system.
- They use scientific methods to be accurate when performing hacking jobs.

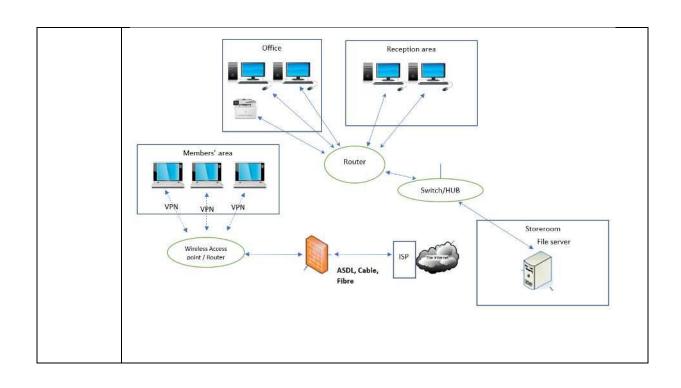
Accidental damage

- This is a situation where data is accidentally lost or damage
- An employee can forget to save a file / delete a file by accident
- Errors when inputting data can cause processing mistakes
- Errors in software can cause the programs to crash and data can be lost
- Power surges/failures can cause data loss.

Mark scheme (award up to 8 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.

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Level 0	Mark 0	Descriptor No rewardable material.
Level 1	1-3	 Demonstrates isolated elements of knowledge and understanding There will be major gaps or omissions Few of the points made will be relevant to the context in the question Limited discussion which contains generic points Little or no consideration of different aspects
Level 2	4-6	 Demonstrates some accurate knowledge and understanding There will be some gaps or omissions Some of the points made will be relevant to the context in the question, but the link will not always be clear Displays a partially developed discussion which considers some different aspects There will be some consideration of how they interrelate
Level 3	7-8	 Demonstrates mostly accurate and detailed knowledge and understanding There will be minor gaps or omissions Most of the points made will be relevant to the context in the question, and there will be clear links Displays a well-developed and logical discussion which clearly considers a range of different aspects Clearly shows how they interrelate

Question Number	Indicative content
3a	A diagram of a potential system / integration of IT systems and connections used to meet the requirements of the scenario i.e. the home working and entertainment system.
	Example response – note this is indicative only. Credit should be given for a diagram that meets the requirements of the given problem.
	Diagram may include:
	Devices:
	Store room:
	Server - wired Reception desktop PCs - wired Office desktop PCs - wired Office printer - wired Members' area laptops - wireless Staff tablets - wireless
	Annotations:



Level	Descriptor
0 marks	No rewardable material
1-2 marks	Diagram provides partial coverage of devices.
	Limited connections are shown
	Diagram includes some annotations of the connection types used.
3-4 marks	Diagram provides coverage of mostly appropriate devices.
	Connections are shown which meet most requirements of the scenario.
	Diagram includes some annotations of connection types used to meet the majority of the requirements of the scenario, but these may not always be the most efficient.
5-6 marks	Diagram provides thorough coverage of appropriate device which fully meet the requirements of the scenario.
	Connection are shown which fully meet the requirements of the scenario.
	Diagram includes detailed and accurate annotations of devices and connection types used to meet the requirements of the scenario.

Question Number	Answer			
_	Award two marks for each point up to a maximum of six marks Real-time (1) • Monitors external events and processes data as soon as it enters the computer system (1) • Allows the system to respond immediately (1) • Used mostly in embedded devices and automated systems (1) Single-user, single task (1) • Only one user would be able to access the PC at any one time (1) • Can only run one task at a time (1) • Used mostly in older mobile phones, PDAs (1) Multi-user (1)	Mark 6		
	 Allows multiple users to use a computer system and its resources at the same time (1) Used by servers, supercomputers and mainframes (1) 			

Accept any other relevant phrasing/wording	

Question Number	Answer			
3c	 Award one mark for each point up to a maximum of four marks Bowser requests a secure page (https://). Web server sends a public key with its certificate (once secure transaction is initiated) Web browser checks the certificate is from a trusted party (and is still valid) Web browser encrypts a random symmetric encryption key using the public key Sends it to the server with the encrypted URL and other encrypted http data. Using the private key, the web server decrypts the symmetric encryption key (decrypting the URL and http data). Web server sends back the requested html document, http data encrypted with the symmetric key. Web browser decrypts the http data and html document using the symmetric key Displays the information. Accept any other relevant phrasing/wording 	4		

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Question Number	Indicative content
3d	Answers will be credited according to the learner's demonstration of knowledge and understanding of the material, using the indicative content and level descriptors below. The indicative content that follows is not prescriptive. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers.
	Learners will discuss factors that should be taken into consideration when choosing a network (other than purchase cost and security).
	User experience (ease of use, performance, availability, accessibility)
	Ease of Use how easy is it for each user to connect to the network? will users need individual login details?
	Performance speed the network will transfer data
	will the network be able to upload / download media files quickly (for use in training sessions)?
	limited bandwidth in data transmission method would mean slow data transfer speeds, which can result in logging in, saving and loading files taking a long time
	firewalls can slow down data transfer (due to checking for threats)
	 Accessibility will the network be suitable for someone with a disability? will the network be suitable for someone with no knowledge of IT?
	 User needs Staff training needs (initial & ongoing) how can the leisure centre minimise the effect on the staff? cost of training (in house or outsourced) timing (when will the training be scheduled)
	 What will the network be used for? will the staff need to access and share media files (for the training sessions)?
	 Specifications Is the network data transfer speed suitable? Does the network have maximum bandwidth (for data transfer requirements)? Is the power consumption suitable? Is functionality suitable for the leisure centre's purpose?
	 Connectivity How will the network be connected together, e.g., wired or wireless? Dependent on user needs for speed, capacity and reliability Efficiency

- How effective is the network at allowing the staff at the leisure centre to undertake their work?
- Wireless connectivity

will allow the staff more portability due to less cabling (for the tablets/laptops)

slower data transfer speeds

Wired connectivity

will increase security, stability and faster data transfer speeds staff will be restricted to their workstations

Compatibility

- Will the network be compatible with all devices that are to be connected?
- Will the tablets (or any smartphones) be able to connect using the wireless connection?
- Other systems in use by staff, e.g., portable devices need to be checked to ensure compatibility with the new system
- Will desktop PCs need wireless networking cards (in case cabling fails)

Implementation (timescales, testing, downtime)

Timescales

how long will the installation take? Can it be scheduled for a time when the leisure centre is less busy?

is there a target completion date?

if an external company is installing the system, is there a penalty if they do not complete on time?

if Craig's IT staff are installing the system might other tasks get in the way of the work and increase the time it takes to install? will there be a delay between selecting and implementing wireless connection (ISP/broadband provider)?

Testing

has testing been planned thoroughly?

they will need to ensure the server/operating system will work with/be suitable for current IT needs

must ensure new system will work on all platforms stability

software/hardware compatibility

if an external company is installing the system, is there a penalty if they do not complete on time?

Downtime

how long will the staff be unable to access the network services? is there a contingency plan in place for any potential or unplanned downtime?

Productivity

• Improve productivity / efficiency with new system

- Will staff be able to complete their work quickly and efficiently
- Network downtime might have a big impact on productivity, staff would not be able to access resources while system is down

Mark scheme (award up to 8 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.

Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1-3	 Demonstrates isolated elements of knowledge and understanding There will be major gaps or omissions Few of the points made will be relevant to the context in the question Limited discussion which contains generic points Little or no consideration of different aspects
Level 2	4-6	 Demonstrates some accurate knowledge and understanding There will be some gaps or omissions Some of the points made will be relevant to the context in the question, but the link will not always be clear Displays a partially developed discussion which considers some different aspects There will be some consideration of how they interrelate
Level 3	7-8	 Demonstrates mostly accurate and detailed knowledge and understanding There will be minor gaps or omissions Most of the points made will be relevant to the context in the question, and there will be clear links Displays a well-developed and logical discussion which clearly considers a range of different aspects Clearly shows how they interrelate

Question Number	Indicative content		
4a	Answers will be credited according to the learner's demonstration of knowledge and understanding of the material, using the indicative content and level descriptors below. The indicative content that follows is not prescriptive. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers.		
	Learners discuss the advantages and disadvantages of different processes and implications for protecting data and systems.		
	 Differential (backup) is a mixture of full and incremental. The health centre would take a full backup once a week, and incremental backups every day after. The health centre needs to put a plan in place to restore data as quickly as possible, because dealing with private sensitive data would cause issues for them 		
	 Physical Access Controls Access cards can be used by users so they can be scanned to unlock rooms. Each card is encoded so they work on certain doors which gives a level of security for each user. Could cause a problem if a card was lost or stolen. 		

- Keypad access control requires the user to press a passcode to gain entry to a room. Could cause issues if the passcode is not kept secret (passed on to another user, written down, viewed over shoulder).
- Biometric access control scans biometric data to gain access to a room. This will be unique to each individual, e.g., fingerprint, iris, facial recognition. Can be costly to the health centre to implement.

Mark scheme (award up to 10 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.

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Level	Mark	
Level 0	0	No rewardable material.
Level 1	1-4	 Demonstrates isolated elements of knowledge and understanding There will be major gaps or omissions Few of the points made will be relevant to the context in the question Limited discussion which contains generic points Little or no consideration of different aspects
Level 2	5-7	 Demonstrates some accurate knowledge and understanding There will be some gaps or omissions Some of the points made will be relevant to the context in the question, but the link will not always be clear Displays a partially developed discussion which considers some different aspects There will be some consideration of how they interrelate
Level 3	8-10	 Demonstrates mostly accurate and detailed knowledge and understanding There will be minor gaps or omissions Most of the points made will be relevant to the context in the question, and there will be clear links Displays a well-developed and logical discussion which clearly considers a range of different aspects Clearly shows how they interrelate

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Question Number	Indicative content
4b	Answers will be credited according to the learner's demonstration of knowledge and understanding of the material, using the indicative content and level descriptors below. The indicative content that follows is not prescriptive. Answers may cover some/all of the indicative content but should be rewarded for other relevant answers. Learners evaluate the advantages and disadvantages to the health
	centre of the use of social media in the health care sector
	Advantages
	 Effective form of communication that gives medical practitioners tools to share / discuss / promote health awareness with patients more quickly Medical alerts can be updated and shared quickly to raise awareness about health problems, e.g., diabetes, allergies, etc. Medical information/alerts can be shared globally/ to other health care workers Easier to collaborate with other health care workers to share research/experiences Easier / quicker to communicate with patients, due to being housebound / transport issues, etc.) Cost effective marketing for health care workers / patients Platform to showcase activities and accomplishments, using testimonials to show success Attract healthcare professionals Potential patients can search information about Seren from past reviews to choose the right health centre to suit their needs Ease of use, because most patients are already familiar with social media, and have social media access
	Disadvantages
	 Security risks / privacy could be a problem if private/confidential data was leaked/shared Lack of control of what is being posted, once posted on the Internet it stays there forever Time consuming to keep social media updated Reluctance to use a public platform for discussing symptoms/problems Some patients might prefer face to face contact / human interaction Some patients might not have access to social media / technology Some patients might not know how to use technology Cost implications: if training is required to enable staff to make use of full functionality, e.g., security, collaboration tools Patients might find alternative health centres which would cause

Mark scheme (award up to 12 marks) refer to the guidance on the cover of this document for how to apply levels-based mark schemes*.

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Level	Mark	Descriptor
Level 0	0	No rewardable material.
Level 1	1-4	 Demonstrates isolated elements of knowledge and understanding There will be major gaps or omissions Few of the points made will be relevant to the context in the question Limited evaluation which contains generic or descriptive points Little or no conclusion
Level 2	5-8	 Demonstrates some accurate knowledge and understanding There will be some gaps or omissions Some of the points made will be relevant to the context in the question, but the link will not always be clear Displays a partially developed evaluation which considers some different competing points There may be a conclusion which is partially supported
Level 3	9-12	 Demonstrates mostly accurate and detailed knowledge and understanding There may be minor gaps or omissions Most of the points made will be relevant to the context in the question, and there will be clear links Displays a well-developed and logical evaluation which clearly considers different aspects and competing points in detail There is a conclusion that is supported